

reconsideration and withdrawal of the final rejection in view of the following remarks.

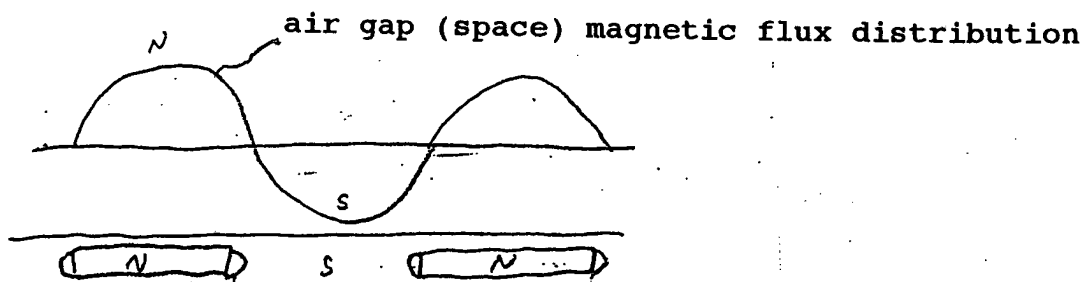
Each of Applicants' independent claims 18 and 19 recite a permanent magnet electric rotating machine. The rotor of said machine has plural permanent magnet insertion holes 10 arranged circumferentially in a ring-shaped arrangement in the rotor 8. Permanent magnets 9 are embedded in the holes 10 alternately having a reversed polarity, i.e., N, S, N... Auxiliary magnetic pole portions 16 are provided between each two adjacent permanent magnets 9. A magnetic air gap 14 is provided either in both sides in the peripheral direction of the permanent magnets 9 (claim 18) or between the auxiliary magnetic pole portions 16 and magnetic pole piece portions 15 (claim 19).

As specifically recited in claims 18 and 19, as a result of the claimed structure, a change in the magnetic flux density between the permanent magnets and the auxiliary magnetic pole portions is formed smoothly and a cogging torque is restrained. Applicants therefore attempted to solve a problem previously existing with the use of a permanent magnet rotor of a permanent electric rotating machine (see page 4, lines 1-9 and 15-20). Applicants' structure moderates, i.e. forms smoothly the change in magnetic flux density between the permanent magnet and the auxiliary pole portion, accordingly the cogging torque is restrained (see, for example, page 5, lines 15-18).

Regarding JP '050, a permanent magnet synchronous electric motor has slots 5 in the rotor core 4 every pole pitch. Permanent magnets 5a having the

same polarity in the radial direction are inserted into the slots. In the vicinity of the outer periphery, holes 6 are provided for preventing leakage magnetic flux. As recognized by the Examiner, the adjacent permanent magnets 5a of JP '050 have the same polarity, not alternate polarities as claimed in Applicants' invention. Because of this, the rotor core portion 4a in JP '050 between the adjacent permanent magnets 5a does not form auxiliary magnetic poles as in Applicants' claimed invention.

Accordingly, the rotor of JP '050, the magnetic flux density between the rotor core portion 4 of the adjacent permanent magnets 5, and the permanent magnets 5a would have slack from the beginning as shown in the following figure:



air gap for preventing leakage between poles  
(since there is air gap between N and S, the effect for forming slack (gently or loose) the magnetic flux distribution is small)

In view of the above, in JP '050, the technical problem of moderating the magnetic flux distribution between the permanent magnet and the auxiliary magnetic pole, as is necessary in the present invention, is not present. Hence, because JP '050 did not present the problem which Applicants' invention solved, one skilled in the art would not consider any other reference in combination with it.

Of course, the use of hindsight is not appropriate in an obviousness combination. Yet, the secondary JP '436 reference is utilized for providing adjacent permanent magnets 8 having different polarities. However, in JP '436, no magnetic air gap is provided between the rotor main body portion 3a (auxiliary magnetic pole) of the adjacent permanent magnets 8 and the permanent magnet 8. In other words, JP '436 merely discloses a known structure for forming an auxiliary magnetic pole and for utilizing a reluctance torque. It does not disclose Applicants' technical solution of moderating the magnetic flux density between the permanent magnet and the auxiliary magnetic pole. Hence, Applicants submit one skilled in the art would have no motivation to combine JP '436 with JP '050, absent Applicants' teachings.

Reiterating, in JP '050 there is no necessity for solving the problem of moderating the magnetic flux distribution between the permanent magnet and the auxiliary magnet pole as shown in the present invention. On the other hand, in JP '436 there is no technical teaching of moderating the magnetic flux density between the permanent magnet and the auxiliary magnetic pole. Because

neither reference recognizes the idea of moderating the magnetic flux density, one skilled in the art would not be motivated to make such a combination.

In view of the foregoing, Applicants submit independent claims 18 and 19 are patentable over JP '050, whether taken alone or in combination with JP '436. Moreover, claims 20-25 depend from these claims, respectively, and are also submitted to be patentable.


For the foregoing reasons, Applicants request reconsideration of the final rejection and allowance of all claims 18-27. An early notice to that effect is solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #381NP/43816CO).

Respectfully submitted,

December 23, 2002

  
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